Notice of Allowability	Application No. 10/653,550	Applicant(s) STANOI ET AL.
	Examiner Shew-Fen Lin	Art Unit 2166

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *7/3/2006*.

2. ☒ The allowed claim(s) is/are *1-5, 7-18 (renumbered as 1-17)*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

     a) ☐ All   b) ☐ Some*   c) ☐ None   of the:

        1. ☐ Certified copies of the priority documents have been received.

        2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

        3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

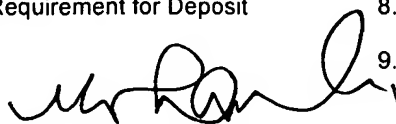   * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.

     (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached

        1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____ .

     (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of
        Paper No./Mail Date _____ .

     Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)

2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)

3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____

4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material

5. ☐ Notice of Informal Patent Application

6. ☒ Interview Summary (PTO-413), Paper No./Mail Date *20060830* .

7. ☒ Examiner's Amendment/Comment

8. ☒ Examiner's Statement of Reasons for Allowance

9. ☐ Other _____ .

MOHAMMAD ALI
PRIMARY EXAMINER

DETAILED ACTION

a. This action is responsive to amendment filed on 7/3/2006.

b. Claims 1-5 and 7-18 (renumber as 1-17) are allowed. Claim 6 is cancelled.

Examiner's Amendment

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone conversation with Applicant's attorney Victor Grossman on August 29, 2006.

Please amend the claims, which was filed on 7/3/2006, as follows:

1. (Currently Amended) A method for processing queries of hierarchical tagged data using hints, said hints being navigational aids and said processing being performed on a computing device, the method comprising:

providing a plurality of hints for the hierarchical tagged data, said data having a plurality of nodes l and c such that l is a parent of c;

pruning the hierarchical tagged data using said plurality of hints to avoid unnecessary navigation when processing said queries;

.updating said hints in accordance with required navigation workload and updates and

changes to the hierarchical tagged data;

providing a usefulness matrix for calculating a usefulness of each of said hints, wherein

for a pre-defined parameter $0 \leq \alpha \leq 1$, the usefulness of the hint is calculated as $Usf_{h(l,c,t)} = (1+$

$\alpha \times semW_{h(l,c,t)}) \times \underline{s}Usf_{h(l,c,t)}$, where $semW_{h(l,c,t)}$ is a semantic weight and $sUsf_{h(l,c,t)}$ is a

structural usefulness of the hint; ~~and~~

selecting ~~techniques for~~ hints according to limitations on an allocated memory size of

said computing device <u>and the usefulness of the hint; and</u>

<u>storing the selected hints for querying processing.</u>

5. (Currently Amended) A method of utilizing one or more hints for query processing over a

hierarchical tagged data structure in a computing system having memory, the data structure

having a plurality of nodes l and c such that l is a parent of c, the hint, represented as h(l, c, t),

being positive if there is a tag t accessible in top-down traversal from c and otherwise negative,

said method comprising steps of:

for each tag in ~~the~~ <u>an</u> XML document, the computing system:

calculating <u>and storing</u> each hint and a usefulness of each hint;

selecting a number of hints k having a greatest usefulness, where k equals a total memory

size divided by a size of the hint;

providing a usefulness matrix for calculating a usefulness of each of said hints, wherein

for a pre-defined parameter $0 \leq \alpha \leq 1$, the usefulness of the hint is calculated as $Usf_{h(l,c,t)} = (1 + \alpha \times semW_{h(l,c,t)}) \times \underline{s}Usf_{h(l,c,t)}$, where $semW_{h(l,c,t)}$ is a semantic weight and $sUsf_{h(l,c,t)}$ is a structural usefulness of the hint; and

eliminating redundant hints.

9. (Currently Amended) A method of utilizing one or more hints for query processing over a hierarchical tagged data structure in a computing system having memory, the data structure having a plurality of nodes l and c such that l is a parent of c, the hint represented as $h(l, c, t)$, being positive if there is a tag t accessible in top-down traversal from a child node and otherwise negative, said method comprising steps of:

for each tag in the data structure, the computing system:

(a) calculating a bitmap for a current node $B(current)$ with all bits set to one;

(b) setting a bit of a current tag $B(current)[tag(current-tag)]$ to zero;

(c) calculating a plurality ~~of possible~~ non-redundant hints for each child node;

(d) ~~refreshing a hint list; and~~

~~(e)~~ providing a usefulness matrix for calculating a usefulness of each of said hints, wherein for a pre-defined parameter $0 \leq \alpha \leq 1$, the usefulness of the hint is calculated as $Usf_{h(l,c,t)} = (1 + \alpha \times semW_{h(l,c,t)}) \times \underline{s}Usf_{h(l,c,t)}$, where $semW_{h(l,c,t)}$ is a semantic weight and $sUsf_{h(l,c,t)}$ is a structural usefulness of the hint; and

(e) refreshing a hint list and the usefulness of each of said hints.

14. (Currently Amended) A computer program device readable by a machine, tangibly

embodying a program of instructions executable by the machine to perform method steps for

utilizing one or more hints for query processing over a hierarchical tagged data structure in a

computing system having memory, the data structure having a plurality of nodes l and c such that

l is a parent of c, the hint, represented as $h(l, c, t)$, being positive if there is a tag accessible in

top-down traversal from a child node, and otherwise negative, said method comprising steps of:

for each tag in the data structure, the machine using the computer program device for:

(a) calculating a bitmap for a current node $B(current)$ with all bits set to 1;

(b) setting a bit of a current tag $B(current)[tag(current-tag)]$ to zero;

(c) calculating a plurality ~~of possible~~ non-redundant hints for each child node;

(d) ~~refreshing a hint list; and~~

~~(e)~~ providing a usefulness matrix for calculating a usefulness of each of said hints,

wherein for a pre-defined parameter $0 \leq \alpha \leq 1$, the usefulness of the hint is calculated as $Usf_{h(l,c,t)}$

$= (1 + \alpha \times semW_{h(l,c,t)}) \times \underline{s}Usf_{h(l,c,t)}$, where $semW_{h(l,c,t)}$ is a semantic weight and $sUsf_{h(l,c,t)}$ is a

structural usefulness of the hint; <u>and</u>

<u>(e) refreshing a hint list and the usefulness of each of said hints.</u>

Reasons for Allowance

The following is an examiner's statement of reasons for allowance:

Independent claims 1, 5, 9, and 14 each recites, among other limitations, the limitation of

"providing a usefulness matrix for calculating a usefulness of each of said hints, wherein for a

pre-defined parameter $0 \leq \alpha \leq 1$, the usefulness of the hint is calculated as $Usf_{h(l,c,t)} = (1 + \alpha \times semW_{h(l,c,t)}) \times sUsf_{h(l,c,t)}$, where $semW_{h(l,c,t)}$ is a semantic weight and $sUsf_{h(l,c,t)}$ is a structural usefulness of the hint" to define hints used to prune the query path for fast access.

It is noted that many prior arts (for example, Linden et al. (US PGP, 2005/0050011) teach using hint for query, but none of them teaches this limitation of "a usefulness matrix for calculating a usefulness of each of said hints" to define hints for querying. The patentability of Applicants' invention was examined and evaluated against the prior art listed below. These prior art are considered pertinent to the subject matter of Applicants' invention, as discussed next,

- Myllymaki; Jussi Petri, US 6757678 B2, "Generalized method and system of merging and pruning of data trees".

- Chen; Zhiyuan et al., US 6738762 B1, "Multidimensional substring selectivity estimation using set hashing of cross-counts".

- Chakraborty; Krishnendu et al., US 6542911 B2, "Method and apparatus for freeing memory from an extensible markup language document object model tree active in an application cache".

- Van Der Linden, Robbert C. et al., US 20050050011 A1, "hod and system for querying structured documents stored in their native format in a database".

- Fontoura, Marcus F. et al., 20040205082 A1, "tem and method for querying XML streams".

- Min, Jun-Ki et al., 20040098384 A1, "hod of processing query about XML data using APEX".

However, none of the prior art of the record teaches or suggests, independently or in combination, the combination of claimed elements including the specific features recited by the independent claims, 1, 5, 9, and 14 as indicated above.

The dependent claims, being definite, further limiting, and fully enabled by the specification and are also allowed.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shew-Fen Lin whose telephone number is 571-272-2672. The examiner can normally be reached on 8:30AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hosain Alam can be reached on 571-272-3978. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.
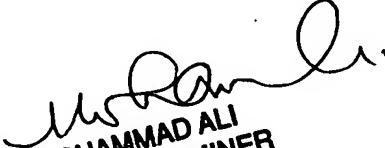
Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Shew-Fen Lin   Art Unit 2166
Patent Examiner   August 31, 2006

MOHAMMAD ALI
PRIMARY EXAMINER